Appendix E. Engineering Drawings
(Part 7 of 10)
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1. NOTED DIAMOND DEAD SECTION - 2F
2. THE PROPOSED WEST LAKE EXTENSION WILL CONNECT TO THE SOUTH SHORE LINE WITHIN THE SOUTH SHORE LINE'S EIRL CROSSING VIA A 90° TURNOUT ON TRACK 1. THE NEW WFMN WFMN WILL BE LOCATED JUST EAST OF THE IHBRR DIAMOND. THE NEW SIGNAL FROM THE WEST LAKE EXTENSION WILL BE 6W.
3. NEW 2W AND 4W SIGNALS WILL BE LOCATED ON THE RE-ALIGNED SOUTH SHORE LINE. THERE WILL BE A NEW PRE-WIRED MICROPROCESSOR BASED CIH. THE EXISTING CIH WILL BE USED TO INTERFACE THE NEW CIH WITH THE EXISTING WAYSIDE SIGNAL EQUIPMENT.
4. THE EASTBOUND CROSSING STARTS FOR DEARBORN ST. WILL BE RETIRED SINCE THESE HIGHWAY GRADE CROSSINGS WILL BE RETIRED.

NOT FOR CONSTRUCTION

NORTHERN INDIANA COMMUTER TRANSPORTATION DISTRICT
33 East Highway 12
Chesperial, Indiana 46304

DYER TO HAMMOND, INDIANA

PLOT DATE: 7/19/2017 9:38:53 PM

HDR Engineering, Inc.
8550 W Bryn Mawr Ave., Suite 900
Chicago, IL 60631

HDR ENGINEERING

57C #9
6E
SNOW MELTER POWER

NOTES:

1. SEE PLAN SS06990
2. LOCATED JUST EAST OF THE IHBRR DIAMOND. THE NEW ON TRACK 1. THE NEW SWITCH WILL BE 6N.
3. STATE LINE CP 69.2 INTERLOCKING VIA A #15 TURNOUT TO THE SOUTH SHORE LINE WITHIN EXISTING NORTH STATE LINE SIDING
4. THE PROPOSED WEST LAKE EXTENSION WILL CONNECT TO THE SOUTH SHORE LINE WITHIN THE SOUTH SHORE LINE'S EIRL CROSSING VIA A 90° TURNOUT ON TRACK 1. THE NEW WFMN WFMN WILL BE LOCATED JUST EAST OF THE IHBRR DIAMOND. THE NEW SIGNAL FROM THE WEST LAKE EXTENSION WILL BE 6W.
5. THE CONTROL LINES NEED TO BE REVISED DUE TO THE RELOCATION OF THE HAMMOND DUE TO POSSIBLE TRAIN OPERATION CONFLICT WITH IHBRR AT GRADE CROSSING.

NOT FOR CONSTRUCTION

NORTHERN INDIANA COMMUTER TRANSPORTATION DISTRICT
33 East Highway 12
Chesperial, Indiana 46304

DYER TO HAMMOND, INDIANA

PLOT DATE: 7/19/2017 9:38:53 PM

HDR Engineering, Inc.
8550 W Bryn Mawr Ave., Suite 900
Chicago, IL 60631

HDR ENGINEERING

57C #9
6E
SNOW MELTER POWER
NOTES:
1. EXISTING HAMMOND CP 88.8 GAUNTLET TRACKS WILL BE RETIRED WHEN THE SOUTH SHORE LINE IS REALIGNED.
2. PROPOSED HAMMOND CP 88.8 GAUNTLET TRACKS WILL BE A NEW INTERLOCKING LOCATED ON THE REALIGNED SOUTH SHORE LINE JUST EAST OF EXISTING NORTH STATE LINE CP 68.8.
3. HAMMOND CP 88.8 SHOULD BE A SEPARATE INTERLOCKING FROM NORTH STATE LINE CP 68.2 DUE TO POSSIBLE TRAIN OPERATION CONFLICT WITH IHBRR AT GRADE CROSSING.
4. PROPOSED SHEFFIELD HIGHWAY GRADE CROSSING WILL BE WITHIN HAMMOND CP 68.8 INTERLOCKING LIMITS.
NOTES:
1. POLING MAPS TO BE SHOWN
2. T-51'S AND E-51'S CONTROL POINTS ON THE WEST LAKE
   EXTEND ON TO THE END OF ALL UNATTACHED CONSTITUTED T-I'S. TO BE A TYPICAL DRAWING FOR ALL FIVE CONTROL POINTS.

- NIPSCO NATURAL GAS LINE
- NATURAL GAS GENERATOR
- AC POWER STAND-BY
- GAS LINE NATURAL
- NATURAL GAS PIPE

SOUTHBOUND CROSSING
SOUTHBOUND CROSSING

NOT FOR CONSTRUCTION

CP 64.9 END OF SIDING LOC PLAN SYSTEM

NORTHERN INDIANA COMMUTER TRANSPORTATION DISTRICT
313 East Highway 12
Chesterton, Indiana 46304

WEST LAKE CORRIDOR
DYER TO HAMMOND, INDIANA

HDR Engineering, Inc.
Chicago, IL 60631
8550 W. Bryn Mawr Ave., Suite 900

DATE: 7/20/2017
PLOT DATE: 2:30:32 PM

DESIGNED: JKE MALLA

FILENAME: CP 64.9 SHT_WL_CSIG_PLN_728
FISHER ST HWY GRADE CROSSING

NOT FOR CONSTRUCTION

NORTHERN INDIANA COMMUTER TRANSPORTATION DISTRICT
DIAMOND È WEST LAKE CORRIDOR - MP WL 61.38 TO WL 69.18

FISHER ST HWY GRADE CROSSING SYSTEM

1. FISHER STREET IS A QUIET ZONE CROSSING. INSTALL A 100 MEDIAN IN THE ROAD ON BOTH SIDES OF THE TRACKS MEASURED FROM THE CROSSING. INSTALL A BOLLARD IN THE SHARED USE PATH AT THE MEDIAN OPENING.

2. AUDIO FREQUENCY OVERLAY (AFO) TRACK CIRCUITS ARE USED FOR TRAIN DETECTION AND ACTIVATION OF THIS RAIL-HIGHWAY GRADE CROSSING. CONTRACTOR SHALL DESIGN AN AFO ASSIGNMENT PLAN TO SATISFY 790 HZ ELECTROCODE (5TH ORDER HARMONIC) OVERLAY DESIGN REQUIREMENTS AT THIS CROSSING. THE 790 HZ PHASE SHIFT OVERLAY IS NOT COMPATIBLE WITH 156 HZ ELECTROCODE (5TH ORDER HARMONIC).
30 SECONDS AT 79 MILES PER HOUR

MINIMUM LENGTH OF ISLAND CIRCUIT 120 FEET

NOTES:
1. RIDGE RD IS A QUIET ZONE CROSSING. INSTALL A FOUR QUADRANT GATE WARNING SYSTEM WITH WHEEL LOOP AND AUDIO FREQUENCY OVERLAY (AFO) TRACK CIRCUITS TO DELAYED TO PREVENT TRAPPED MOTORIST ON CROSSING.

2. THIS CROSSING PRE-EMPTS THE TRAFFIC SIGNALS AT MANOR AVE.

3. AUDIO FREQUENCY OVERLAY (AFO) TRACK CIRCUITS ARE USED FOR TRAIN DETECTION AND ACTUATION OF THIS RAIL-HIGHWAY GRADE CROSSING. CONTRACTOR SHALL DESIGN AN AFC ASSIGNMENT PLAN TO GIVE 20 SECONDS MINIMUM WARNING TIME PRIOR TO THE ARRIVAL OF TRAIN AT THIS CROSSING. 790 HZ PHASE SHIFT OVERLAY IS NOT COMPATIBLE WITH ELECTROCODE 5TH ORDER HARMONIC.)

COMPATIBLE 156 HZ ELECTROCODE (5TH ORDER

MINIMUM WARNING TIME PRIOR TO THE ARRIVAL OF TRAIN

RAIL-HIGHWAY GRADE CROSSING. CONTRACTOR SHALL

USED FOR TRAIN DETECTION AND ACTUATION OF THIS

AUDIO FREQUENCY OVERLAY (AFO) TRACK CIRCUITS ARE

3.
NOTES:

1. **TOMO ST** IS A CLEAT TYPE CROSSING. INITIAL A FOUR-OAK ARMATURE GATE. WARNING SYSTEM ATTACHES A LOOP GATE ARMATURE GATE. WARNING SYSTEM IS USED TO PREVENT TRAFFIC MOVEMENT ON CROSSING.

2. AUDIO FREQUENCY OVERLAY (AFO) TRACK CIRCUITS ARE USED FOR TRAIN DETECTION AND ACTUATION OF THE RAIL-HIGHWAY GRADE CROSSING. CONTRACTOR SHALL DESIGN AN AUDIO ASSIGNMENT PLAN TO GIVE 20 SECONDS WARNING TO HIGHWAY TRAFFIC BEFORE ACTUATING THE CROSSING WARNING SYSTEM. IF THE CROSSING WARNING SYSTEM IS NOT COMPATIBLE WITH ELECTRIFIED OR NON-ELECTRIFIED (WITH ORDERED INTERLOCKING). 

3. **TOMO ST** GRADE CROSSING IS LOCATED WITHIN CP 65.3 INTERLOCKING LIMIT.

4. SWITCH-POSITION IS USED TO DETERMINE WHETHER OCCUPIED NORTH-SOUTH APPROACH ON MAIN OR SIDDING TRACK WILL ACTIVATE CROSSING WARNING DEVICES.

5. TRAIN ON CROSSING APPROACH CIRCUIT SHALL NOT ACTIVATE WARNING DEVICES. CURB STOPLIGHTS. INSTRUCTORS OF TRAIN DEPARTED. ACTUATIONS OF THE INTERLOCKING DEVICES SHALL NOT BE DISPLAYED UNTIL CROSSING GATE REPEATER IS SET. WARNING DEVICES UNTIL INTERLOCKING SIGNAL IS REQUESTED.

6. WHEN TRAIN MEET OCCURS DIRECTIONAL CITY CIRCUITS MUST BE RELEASED BEFORE OPPOSING TRAIN MOVEMENT ACTIVATES CROSSING WARNING DEVICES.
NOTES:

1. KENWOOD ST IS A QUIET ZONE CROSSING. INSTALL A FOUR QUADRANT GATE WARNING SYSTEM WITH MANUALLY OPERATED GATES DELAYED TO PREVENT TRAPPED MOTORIST ON CROSSING.

2. AUDIO FREQUENCY OVERLAY (AFO) TRACK CIRCUITS ARE USED FOR TRAIN DETECTION AND ACTUATION OF THIS RAIL-HIGHWAY GRADE CROSSING. CONTRACTOR SHALL DESIGN AN AFO ASSIGNMENT PLAN TO GIVE 20 SECONDS MINIMUM WARNING PERIOD PRIOR TO THE ARRIVAL OF TRAIN AT THIS CROSSING. 790 HZ ELECTROCODE (5TH ORDER HARMONIC) DELAYED TO PREVENT TRAPPED MOTORIST ON CROSSING.

3. QUADRANT GATE WARNING SYSTEM WITH VEHICLE LOOP DETECTION.

4. KENWOOD ST IS A QUIET ZONE CROSSING. INSTALL A FOUR QUADRANT GATE WARNING SYSTEM.
30 SECONDS AT 79 MILES PER HOUR

MINIMUM LENGTH OF ISLAND CIRCUIT 120 FEET

NOTES:

1. CONKEY ST IS A QUIET ZONE CROSSING. INSTALL A FOUR QUADRANT GATE WARNING SYSTEM WITH HARDWARE FOR THE ENTRANCE AND EXIT GATES. PHASE SHIFT OVERLAY IS NOT COMPATIBLE WITH ELECTROCODE (5TH ORDER HARMONIC). TIME REDUCED TO PREVENT TRAPPED MOTORIST ON CROSSING.

2. AUDIO FREQUENCY OVERLAY (AFO) TRACK CIRCUITS ARE USED FOR TRAIN DETECTION AND ACTUATION OF THIS RAIL-HIGHWAY GRADE CROSSING. CONTRACTOR SHALL DESIGN AN AFO ASSIGNMENT PLAN TO GIVE 30 SECONDS MINIMUM WARNING TO IN-TRANSPORTATION DISTRICT NORTH OF CONKEY STREET 654AT

3. CONKEY ST HWY GRADE CROSSING SYSTEM

DYER TO HAMMOND, INDIANA
NOTES:
1. DETROIT ST IS A QUIET ZONE CROSSING. INSTALL A FOUR QUADRANT GATE WARNING SYSTEM WITH A 20 SECOND TIMED DELAY TO PREVENT TRAPPED MOTORIST ON CROSSING.
2. AUDIO FREQUENCY OVERLAY (AFO) TRACK CIRCUITS ARE USED FOR TRAIN DETECTION AND ACTUATION OF THIS RAIL-HIGHWAY GRADE CROSSING. CONTRACTOR SHALL DESIGN AN AFO ASSIGNMENT PLAN TO GIVE 20 SECONDS MINIMUM WARNING TIMING PRIOR TO THE ARRIVAL OF TRAIN AT THIS CROSSING. 750 HZ ELECTROCODE (5TH ORDER HARMONIC). PHASE SHIFT OVERLAY IS NOT COMPATIBLE 156 HZ ELECTROCODE.
3. ELECTROCODE (156 HZ) TIMR PRIOR TO THE ARRIVAL OF TRAIN AT THIS CROSSING.
4. CONTRACTOR SHALL DESIGN AN AFO ASSIGNMENT PLAN TO GIVE 20 SECONDS MINIMUM WARNING TIMING PRIOR TO THE ARRIVAL OF TRAIN AT THIS CROSSING.
5. CONTRACTOR SHALL DESIGN AN AFO ASSIGNMENT PLAN TO GIVE 20 SECONDS MINIMUM WARNING TIMING PRIOR TO THE ARRIVAL OF TRAIN AT THIS CROSSING.
6. CONTRACTOR SHALL DESIGN AN AFO ASSIGNMENT PLAN TO GIVE 20 SECONDS MINIMUM WARNING TIMING PRIOR TO THE ARRIVAL OF TRAIN AT THIS CROSSING.
7. CONTRACTOR SHALL DESIGN AN AFO ASSIGNMENT PLAN TO GIVE 20 SECONDS MINIMUM WARNING TIMING PRIOR TO THE ARRIVAL OF TRAIN AT THIS CROSSING.
8. CONTRACTOR SHALL DESIGN AN AFO ASSIGNMENT PLAN TO GIVE 20 SECONDS MINIMUM WARNING TIMING PRIOR TO THE ARRIVAL OF TRAIN AT THIS CROSSING.
9. CONTRACTOR SHALL DESIGN AN AFO ASSIGNMENT PLAN TO GIVE 20 SECONDS MINIMUM WARNING TIMING PRIOR TO THE ARRIVAL OF TRAIN AT THIS CROSSING.
NOTES:

1. HIGHLAND ST IS A QUIET ZONE CROSSING. INSTALL A FOUR QUADRANT GATE WARNING SYSTEM WITH HORIZONTAL LOOP SENSOR TO DELAYED TO PREVENT TRAPPED MOTORIST ON CROSSING.

2. AUDIO FREQUENCY OVERLAY (AFO) TRACK CIRCUITS ARE USED FOR TRAIN DETECTION AND ACTUATION OF THIS RAIL-HIGHWAY GRADE CROSSING. CONTRACTOR SHALL DESIGN AN AFO ASSIGNMENT PLAN TO GIVE 20 SECONDS MINIMUM WARNING WHEN RAILROAD PRESENCE IS DETECTED. AE POSITION IS NOT COMPLETE AT 155 HZ ELECTROCODE (5TH ORDER HARMONIC).

3. DELAYED TO PREVENT TRAPPED MOTORIST ON CROSSING.

4. DESCENTION OF EXIT GATES MUST BE QUADRANT GATE WARNING SYSTEM WITH VEHICLE LOOP DETECTION.

5. HIGHLAND ST IS A QUIET ZONE CROSSING. INSTALL A FOUR QUADRANT GATE WARNING SYSTEM WITH HORIZONTAL LOOP SENSOR TO DELAYED TO PREVENT TRAPPED MOTORIST ON CROSSING.

AC SERVICE

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HDR ENGINEERING

www.hdrinc.com
Chicago, IL 60631
8550 W Bryn Mawr Ave., Suite 900
HDR Engineering, Inc.

DATE
SHEET_WL_CSIG_PLN_736
FILENAME
9:40:24 PM
DESCRIPTION
ISSUE
CHICAGO, IL
NOTES:

NOTICE:

FOR
CONSTRUCTION

NORTHERN INDIANA COMMUTER TRANSPORTATION DISTRICT
33 East Highway 12
Chesterton, Indiana 46304

DATE
7/19/2017
PLOT DATE
9:40:24 PM
DESCRIPTION
NOTES:

HIGHLAND ST HWY GRADE CROSSING SYSTEM
NICTD - WEST LAKE CORRIDOR - MP WL 61.38 TO WL 69.18
SINGLE TRACK

NOT FOR CONSTRUCTION

FILE: CSGPL-31 OF CSGPL-36

DIAGRAM

139 OF 248

SHT_WL_CSIG_PLN_736
FILENAME
9:40:24 PM
DESCRIPTION
ISSUE
CHICAGO, IL
NOTES:

NOTICE:

FOR
CONSTRUCTION

NORTHERN INDIANA COMMUTER TRANSPORTATION DISTRICT
33 East Highway 12
Chesterton, Indiana 46304

DATE
7/19/2017
PLOT DATE
9:40:24 PM
DESCRIPTION
NOTES:

HIGHLAND ST HWY GRADE CROSSING SYSTEM
NICTD - WEST LAKE CORRIDOR - MP WL 61.38 TO WL 69.18
SINGLE TRACK

NOT FOR CONSTRUCTION

FILE: CSGPL-31 OF CSGPL-36

DIAGRAM

139 OF 248
32 SECONDS AT 79 MILES PER HOUR

MINIMUM LENGTH OF ISLAND CIRCUIT 120 FEET

NOTES:
1. WALTHAM ST IS A QUIET ZONE CROSSING. INSTALL A FOUR QUADRANT GATE WARNING SYSTEM WITH 20 SECONDS MINIMUM WARNING FROM ARRIVAL OF TRAIN. QUADRANT GATE WARNING SYSTEMS MUST BE DELAYED TO PREVENT TRAPPED MOTORIST ON CROSSING.
2. AUDIO FREQUENCY OVERLAY (AFO) TRACK CIRCUITS ARE USED FOR TRAIN DETECTION AND ACTIVATION OF THIS RAIL-HIGHWAY GRADE CROSSING. CONTRACTOR SHALL DESIGN AN AFO ASSIGNMENT PLAN TO GIVE 20 SECONDS MINIMUM WARNING TIME PRIOR TO THE ARRIVAL OF TRAIN AT THIS CROSSING. PULSE SHIFT DISPLAY IS NOT COMPATIBLE AT 155 HZ ELECTRODE VOLTAGE (5TH ORDER HARMONIC).

WALTHAM ST IS A QUIET ZONE CROSSING. INSTALL A FOUR QUADRANT GATE WARNING SYSTEM WITH 20 SECONDS MINIMUM WARNING FROM ARRIVAL OF TRAIN. QUADRANT GATE WARNING SYSTEMS MUST BE DELAYED TO PREVENT TRAPPED MOTORIST ON CROSSING.

AUDIO FREQUENCY OVERLAY (AFO) TRACK CIRCUITS ARE USED FOR TRAIN DETECTION AND ACTIVATION OF THIS RAIL-HIGHWAY GRADE CROSSING. CONTRACTOR SHALL DESIGN AN AFO ASSIGNMENT PLAN TO GIVE 20 SECONDS MINIMUM WARNING TIME PRIOR TO THE ARRIVAL OF TRAIN AT THIS CROSSING. PULSE SHIFT DISPLAY IS NOT COMPATIBLE AT 155 HZ ELECTRODE VOLTAGE (5TH ORDER HARMONIC).
NOTES:

1. AUDIO FREQUENCY OVERLAY (AFO) TRACK CIRCUITS ARE USED FOR TRANSMISSION AND ACTIVATION OF THE RAILWAY WARNING SYSTEM TO GIVE 30 SECONDS MINIMUM WARNING TIME PRIOR TO THE ARRIVAL OF TRAIN AT THIS CROSSING. 156 HZ PHASE SHIFT OVERLAY IS NOT COMPATIBLE WITH 156 HZ ELECTROCODE (5TH ORDER HARMONIC).

2. THIS HIGHWAY GRADE CROSSING IS LOCATED WITHIN HAMMOND CP 68.8 INTERLOCKING LIMITS.

HANOVER ST

NOT FOR CONSTRUCTION

NORTHERN INDIANA COMMUTER TRANSPORTATION DISTRICT
DYER TO HAMMOND, INDIANA

DATE: 7/19/2017
DESCRIPTION: SHEFFIED AVE HWY GRADE CROSSING SYSTEM

FILENAME: SHT_WL_CSIG_PLN_739
DESCRIPTION: ISSUE AS NOTED

HDR Engineering, Inc.
Chicago, IL 60631
8550 W Bryn Mawr Ave., Suite 900
HDR.com
NOTES:

1. EXISTING SOUTH SHORE Line TRACK NO. 3 N W ALONG WITH EXISTING INDIANA PASSENGER STATION NO. 1 W N W AND INDIANA PASSENGER STATION NO. 1 W S W WILL BE RETAINED.

2. WARNING DEVICES WILL BE INSTALLED AT THE PROPOSED LOCATION OF THE REALIGNMENT

3. NEW AUDIO FREQUENCY OVERLAY (AFO) TRACK CIRCUITS ARE REQUIRED FOR TRAIN DETECTION AND ACTUATION OF THE WARNING DEVICES. CONTRACTOR SHALL DESIGN AN AFO ASSIGNMENT PLAN TO GIVE 20 SECONDS WARNING TIME PRIOR TO THE ARRIVAL OF TRAIN AT 5 M.P.H CROSSING. THE 120 PHASE 0-6' OVERLAY IS NOT COMPATIBLE WITH THE 120 PROPOSED TRACK CIRCUITS.

4. NEW CROSSING CONTROL HOUSE IS REQUIRED FOR THE ADDITIONAL WARNING DEVICES AND AFO TRACK CIRCUITS.

5. NEW CROSSING CONTROL HOUSE IS LOCATED WITHIN THE REALIGNMENT.
GENERAL NOTES

1) SIGNAL HEADS SHALL INCLUDE LED LAMPS

2) WAYSIDE SIGNAL HEADS MAY NEED TO BE OFFSET HEAD TO PROVIDE PROPER PREVIEW AROUND CATENARY POLES AND PORTAL STRUCTURES.
### Item List

<table>
<thead>
<tr>
<th>Item</th>
<th>Part #</th>
<th>QTY</th>
<th>Description</th>
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<tr>
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<td>5Z4600-X</td>
<td>1</td>
<td>17'-1&quot; Aluminum Mast Mounted for 16'-21&quot; Aspect</td>
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<td>5Z7500-X</td>
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<td>Ladder &amp; Rear Platform Assembly</td>
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<tr>
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<td>80920-X</td>
<td>1</td>
<td>Junction Base w/ 1 1/4&quot; Bolt Spacing &amp; 24 Terminal Blocks</td>
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<td>4</td>
<td>5J7461-3X</td>
<td>1</td>
<td>Cast Aluminum Pinnacle</td>
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<tr>
<td>5</td>
<td>5J7461-3X</td>
<td>1</td>
<td>Standoff Assembly w/ Flexible Conduit</td>
</tr>
</tbody>
</table>

### General Notes

1. Signal heads shall include LED lamps.
2. Relay signal heads may need to be offset head to provide proper preview around catenary poles and portal structures.

---

**Rear Platform**

**Colorlight Signal Layout - Single Unit Typical System**

NICTD - West Lake Corridor, MP WL 61.38 To WL 69.18

Dyer to Hammond, Indiana
GENERAL NOTES

1) SIGNAL HEADS SHALL INCLUDE LED LAMPS
2) WAYSIDE SIGNAL HEADS MAY NEED TO BE OFFSET HEAD TO PROVIDE PROPER PREVIEW AROUND CATENARY POLES AND PORTAL STRUCTURES.
GENERAL NOTES

1) SIGNAL HEADS SHALL INCLUDE LED LAMPS
2) WAYSIDE SIGNAL HEADS MAY NEED TO BE OFFSET HEAD TO PROVIDE PROPER PREVIEW AROUND CATHEDRAL POLES AND PORTAL STRUCTURES.
NOTES FOR PEDESTRIAN GATE:
1) MAST IS SCH 40 X 5" (127 mm) X 16' (4877 mm) 
2) HOODS AND BACKGROUND ARE ALUMINUM PAINTED FLAT BLACK 
3) FLASHER LEDS ARE GE 12" (305mm) RG6-RTB-48BV1-I7 
4) BELL IS WESTERN CULLEN/HAYES MODEL 877-CFR ELECTRONIC BELL 
5) 2 TRACK SIGN SHOWN FOR REFERENCE ONLY 
6) CAST ALUMINUM DOUBLE JUNCTION BOX WITH 32 PAIRS OF AAR TERMINALS L&W PART #7D5950-X-PL 
7) WIRED FROM JUNCTION BOX TO CROSSARM WITH #16 19 STRAND OKONITE 
8) 3/8-16 SILICON BRONZE GROUND STUD INCLUDED IN SECONDARY JUNCTION BOX 
9) GATE MECHANISM INCLUDES 3W AC/DC CONTACT HEATER 

NOTES FOR PEDESTRIAN GATE:
1) QUIET ZONE INDICATOR (QZI) IS AIMED TOWARD ONCOMING TRAIN SO THAT IT IS VISIBLE TO TRAIN ENGINEER 
2) ENGINEER WILL NOT SOUND LOCOMOTIVE HORN IF QUIET ZONE INDICATOR IS FLASHING 

NOTES FOR PEDESTRIAN GATE:
1) QUIET ZONE INDICATOR (QZI) IS AIMED TOWARD ONCOMING TRAIN SO THAT IT IS VISIBLE TO TRAIN ENGINEER 
2) ENGINEER WILL NOT SOUND LOCOMOTIVE HORN IF QUIET ZONE INDICATOR IS FLASHING 

NOTES FOR WAYSIDE HORN:
1) QUIET ZONE INDICATOR (QZI) IS AIMED TOWARD ONCOMING TRAIN SO THAT IT IS VISIBLE TO TRAIN ENGINEER 
2) ENGINEER WILL NOT SOUND LOCOMOTIVE HORN IF QUIET ZONE INDICATOR IS FLASHING 

NOTES FOR PEDESTRIAN GATE:
1) QUIET ZONE INDICATOR (QZI) IS AIMED TOWARD ONCOMING TRAIN SO THAT IT IS VISIBLE TO TRAIN ENGINEER 
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NOTES FOR WAYSIDE HORN:
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2) ENGINEER WILL NOT SOUND LOCOMOTIVE HORN IF QUIET ZONE INDICATOR IS FLASHING 

NOTES FOR PEDESTRIAN GATE:
1) QUIET ZONE INDICATOR (QZI) IS AIMED TOWARD ONCOMING TRAIN SO THAT IT IS VISIBLE TO TRAIN ENGINEER 
2) ENGINEER WILL NOT SOUND LOCOMOTIVE HORN IF QUIET ZONE INDICATOR IS FLASHING 

NOTES FOR WAYSIDE HORN:
1) QUIET ZONE INDICATOR (QZI) IS AIMED TOWARD ONCOMING TRAIN SO THAT IT IS VISIBLE TO TRAIN ENGINEER 
2) ENGINEER WILL NOT SOUND LOCOMOTIVE HORN IF QUIET ZONE INDICATOR IS FLASHING
NOTE 1: CONTRACTOR SHALL ENSURE THAT TIES ARE SET AT RIGHT ANGLES TO STRAIGHT STOCK RAIL AND ACCURATELY SPACED PRIOR TO SETTING SWITCH MACHINE.
NOTE 1: CONTRACTOR SHALL ENSURE THAT TIES ARE SET AT RIGHT ANGLES TO STRAIGHT STOCK RAIL AND ACCURATELY SPACED PRIOR TO SETTING SWITCH MACHINE.

NOTE 2: JUNCTION BOX TO BE LOCATED TO SUIT CONDITIONS IN THE FIELD.
NOTES:
1. Furnish and install compression lugs on all cable connections to web of rail and to impedance bonds.
2. Furnish and install 500 kcmil copper cables for cables connected to impedance bonds.
3. Furnish, install and splice bondstrand from 2-1c #6 TW to rails.
4. Use compression lugs for bondstrand connection to rail. Bondstrand shall be connected to rail independent of the impedance bond-rail rail connection.

2-1C #6 AWG TW

500MCM 427 STRAND
CONCENTRIC SYSTEM
IMPEDANCE BOND Layout TYPICAL

NOT FOR CONSTRUCTION

HDR Engineering, Inc.
8550 W Bryn Mawr Ave., Suite 900
Chicago, IL 60631
www.hdrinc.com
NOTES:

1. Rail head bonds shall be in accordance with the requirements of AREMA Signal Manual Part 8.6.25. Insulation of rail head bonds shall be in accordance with the requirements of AREMA Signal Manual Part 8.6.40.

2. Rail head bonding shall be in accordance with the requirements of AREMA Signal Manual Part 8.6.35.

SINGLE CROSSOVER

LEGEND

- Insulated Joint
- Rail Connection Point
- Rail Joint

DETAIL "A"

NOTES:

1. Rail head bonds shall be in accordance with the requirements of AREMA Signal Manual Part 8.6.25. Insulation of rail head bonds shall be in accordance with the requirements of AREMA Signal Manual Part 8.6.40.

2. Rail head bonding shall be in accordance with the requirements of AREMA Signal Manual Part 8.6.35.
NOTES:
1. ALL WIRING #16 UNLESS OTHERWISE NOTED.

SYSTEM
csdt-17 of csgdt-4

ELECTROLOGIX VITAL LAMP DRIVER MODULE TYPICAL SYSTEM

DYER TO HAMMOND, INDIANA

HDR ENGINEERING, INC.
Chicago, IL 60631
8550 W Bryn Mawr Ave., Suite 900
HDR Engineering, Inc.

DATE
7 /1 9 /2 0 1 7

P L O T  D A T E :
9 :4 3 :2 6  P M

DESCRIPTION

ISSUE

DESIGNED:

CHECKED:

DRAWN:

OF

SERIES

NOT FOR CONSTRUCTION

NICTD - WEST LAKE CORRIDOR - MP WL 61.38 TO WL 69.18

HDR ENGINEERING, INC.
Chicago, IL 60631
8550 W Bryn Mawr Ave., Suite 900
HDR Engineering, Inc.

DATE
7 /1 9 /2 0 1 7

P L O T  D A T E :
9 :4 3 :2 6  P M

DESCRIPTION

ISSUE

DESIGNED:

CHECKED:

DRAWN:

OF

SERIES

NOT FOR CONSTRUCTION

NICTD - WEST LAKE CORRIDOR - MP WL 61.38 TO WL 69.18

HDR ENGINEERING, INC.
Chicago, IL 60631
8550 W Bryn Mawr Ave., Suite 900
HDR Engineering, Inc.
NOTES:

1. ALL WIRING #16 UNLESS OTHERWISE NOTED.
ALL WIRING TO BE #14 UNLESS OTHERWISE NOTED.

BREAKERS ARE TO BE SQUARE D, QO TYPE.

1. BREAKERS ARE TO BE SQUARE D, QO TYPE.
2. ALL WIRING TO BE #14 UNLESS OTHERWISE NOTED.

NOTES:

1. BREAKERS ARE TO BE SQUARE D, QO TYPE.
2. ALL WIRING TO BE #14 UNLESS OTHERWISE NOTED.
NOTES:
1. ALL WIRING TO BE #14 AWG, EXCEPT AS NOTED.
2. UPGRADABLE TO 3 CIRCUIT
**Specifications:**

- **Power Supply:** None - SPFL-Powered
- **Output:** Isolated Solid State Switch
- **Output Rating:** 1A @ 300VAC in Free Air
- **Response Time:** 90° 18 Seconds Adjustable
- **Setpoint Range:** 2-12A, 15-55A & 50-200A
- **Setpoint Adjust:** 4.7KΩ Potentiometer
- **Response Time Adjust:** 4 Turn Potentiometer
- **Hysteresis:** 5% Constant
- **Overload:**
  - Continuous: 120A, 400A, 800A
  - 6 Sec: 150A, 400A, 800A
  - 1 Sec: 150A, 400A, 1200A
- **Isolation Voltage:** 500VAC
- **Frequency Range:** 50 - 100Hz
- **Sending Aperture:** 0.80" Square
- **Case:** UL 641-V Flammability Rated
- **Environmental:** 48°F to 115°F (-5°C to 55°C), 0.95% R.H., Non-Condensing, Conformally Coated

**Operational Settings:**

- **Jumper Setting:**
  - **LOW = No Jumper (2 - 12A)**
  - **MID = Pin 1 & 2 (12-55A)**
  - **HIGH = Pin 2 & 3 (50-200A)**

**Operations:**

- **Monitored:**
  - **AMPS:** None or Below Range, Above Trip Level
- **Output:** Open, Closed
- **LED:** Slow (2 Sec), Fast (0.5 Sec)
**NOTES:**
1. TEST CERTIFICATION PER AAR, SECTION 11, CHAPTER 2, PART 4
2. ADD "QD" AT END OF PIN FOR FACTORY INSTALLED QUICK DISCONNECTS

* Wire, insulated, 6 AWG, 2KV, A.I.W. Corp., C(U).L, 90 Degrees C
  EPR Insulation, .070 Thick, Neoprene Jacket, .045 Thick
  Single Conductor, 37 Strands Min. Copper Wire,
  .430 Outside Diameter, Color Black.
NOTES:
1. ALL METAL SURFACES TO BE GALVANIZED
2. ANGLE TO BE 2"x1/4"

SECTION A-A
FRONT VIEW W/O CASE
CASE MOUNT BOLT/HOLES
1/2" x 1 1/2"
(TYPICAL)

SECTION B-B
SNOW MELTER CASE FOUNDATION
"BOTTOM PLATE DETAIL"
1/4" PLATE STEEL SUPPORT
(WELD TO ANGLE)
1/4" PLATE STEEL PLATE SUPPORT
(WELD TO ANGLE)
GROUNDED PLATE GUSSETS ON ALL (4) SIDES OF ANGLE
(TYPICAL)
FIBER PANELS

T10base
PTM
RS232
WCC
PATCH PANELS
SWITCH MATRIX
T1 PBX
STATIONS
WORK MACHINE
CONTROL SERVER
COMM.
(4)
CONSOLES
SWITCH MATRIX
RECORDERS
VOICE SWITCH MATRIX
CONSOLE
MAINTENANCE SWITCH MATRIX
TO MAIN PBX
1 OF 4
FO NODE
OC-48
PTP
RS232

FXS 1
2W

SC FDP
12-port
WCM
FXS 1
TO
FMUX

FAILURE
FOTS
2-pr
Controller
SSCCIII
1-pr

2 4 port SC FDP
6-ct SM FIBER
6-ct SM FIBER

FMUX
FXS
2W
RECORDER
EVENT
PHONE
FXS
2W

3. Dry Contact Closure (Rx)
3. ANALOG telephone FXS
2. RS232 ASYNC
1. MUX circuits:

3. Dry Contact Detector (Tx)
3. ANALOG telephone FXS
2. RS232 ASYNC
1. MUX circuits:

NOTES:
1. SIDE OF OC-FO NODES AND SC FDPS ARE TO BE DETERMINED.
2. NUMBER OF FIBER TERMINATIONS TO BE DETERMINED.
NOTES:
1. SIZE OF PATCH/SPLICE PANELS TO BE DETERMINED.
1. Splice PTC fibers at Hegewisch FOTS
2. Fiber optic media converter use to comm media converter
FIBER OPTIC CABLE LAYOUT
SYSTEM

DYER TO HAMMOND, INDIANA

HIGHWAY GRADE CROSSING

144 PD TO RIDGE RD

144 PD TO LUMINER RIDGE PASSENGER STATION

3 IN 1 1/4" DUCT

3385+

3390+

3395+

3400+

3405+

3410+
FIBER OPTIC CABLE LAYOUT

SYSTEM

NOT FOR CONSTRUCTION

Dyer to Hammond, Indiana

NORTHERN INDIANA COMMUTER TRANSPORTATION DISTRICT
33 East Highway 12
Chesterton, Indiana 46304

HDR Engineering, Inc.
www.hdrinc.com
Chicago, IL 60631
8550 W Bryn Mawr Ave., Suite 900

DATE
SHEET_WL_CSIG_CB_906

SHEET
9 / 1 9 / 2 0 1 7

DESCRIPTION
CP 4.1

to CP 5.1 FOT

IN 1 1/4" DUCT

144 FO

IN 1 1/4" DUCT

141 FO

IN 1 1/4" DUCT

144 FO

OF SERIES

07/21/17

SINGLE TRACK

NICTD - WEST LAKE CORRIDOR - MP WL 61.38 TO WL 69.18

144 FO IN 1 1/4" DUCT

CP 4.1

IN 1 1/4" DUCT

141 FO

IN 1 1/4" DUCT

144 FO
FIBER OPTIC CABLE LAYOUT SYSTEM

DYER TO HAMMOND, INDIANA

HIGHEST GRADE CROSSING

2 FO TO 173RD ST
HIGHWAY GRADE CROSSING

144 FO TO CP 9.5 POT

144 FO IN 1 1/4" DUCT

144 FO IN 1 1/4" DUCT

144 FO TO CP 9.5 POT

144 FO TO CP 9.5 POT
SHALL ENSURE THAT THE SUBSTATION MAINTAINS ALL PROPER CLEARENCES, CAN BE SAFELY TRANSPORTED TO THE EXACT SUBSTATION SIZE, LAYOUT, AND SHIPPING SPLITS SHALL BE FINALIZED BY THE CONTRACTOR. CONTRACTOR SCADA EQUIPMENT FOR NICTD. DISCONNECTS, PROTECTION RELAYS, BUS VOLTAGES AND CURRENT, BATTERY SYSTEM AND GENERAL ALARMS AT THE CONTRACTOR SHALL PROVIDE SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA) EQUIPMENT FOR THE CONTRACTOR SHALL MAINTAIN VEHICULAR AND PEDESTRIAN TRAFFIC WITHIN PUBLIC RIGHT-OF-WAY IN ACCESSORIES, TESTED AND READY FOR SHIPMENT TO SITE FOR INSTALLATION. THE CONTRACTOR SHALL PROVIDE PRE-ENGINEERED OUTDOOR ENCLOSURES FOR THE TRACTION POWER ENCLOSURES SHALL BE SHOP ASSEMBLED COMPLETE WITH THE SPECIFIED SUBSTATION EQUIPMENT AND THE CONTRACTOR SHALL PROVIDE ADDITIONAL #4/0 AWG BARE COPPER CONDUCTOR PIGTAILS FOR CONNECTIONS TO THE SUBSTATION FOUNDATION STEEL REINFORCEMENT SHALL BE CONNECTED TO THE GROUND GRID BY #4/0 AWG BARE COPPER CONDUCTOR PIGTAILS. PROVIDE #4/0 AWG FLEXIBLE COPPER CONDUCTOR PIGTAILS FOR CONNECTIONS TO THE SUBSTATION GROUND SYSTEM SHALL BE COMPRISED OF A GROUND GRID UNDER THE SUBSTATION BUILDING AND GROUND RINGS AROUND THE NIPSCO EQUIPMENT. THE SUBSTATION GROUND SYSTEM SHALL BE CURED A MINIMUM OF 2-½" BEFORE FINISHED GRADE. ALL GROUNDING AND BONDING SHALL COMPLY WITH UL STANDARD 810, WRAP 70, AND ISSUE 30. TYPICAL BONDING DETAILS, SEE DRAWING TP-3.
NOTES

1. ANY OPEN INTERLOCKS IN THE RESET OPENING OF (CIRCUIT BREAKER). NEGATIVE DISCONNECT CANNOT BE USED TO OPEN THE CIRCUIT BREAKER until the CURRENT CIRCUIT BREAKER IS CLOSED.

2. OPENING CIRCUIT BREAKER (52/L1) AND NEGATIVE DISCONNECT CANNOT OCCUR AT THE SAME TIME.

NOT FOR CONSTRUCTION

TPSS #1

SINGLE LINE DIAGRAM

SYSTEM

NOTES

1. ANY OPEN INTERLOCKS IN THE RESET OPENING OF (CIRCUIT BREAKER). NEGATIVE DISCONNECT CANNOT BE USED TO OPEN THE CIRCUIT BREAKER until the CURRENT CIRCUIT BREAKER IS CLOSED.

2. OPENING CIRCUIT BREAKER (52/L1) AND NEGATIVE DISCONNECT CANNOT OCCUR AT THE SAME TIME.

NOT FOR CONSTRUCTION

TPSS #1

SINGLE LINE DIAGRAM

SYSTEM

NOTES

1. ANY OPEN INTERLOCKS IN THE RESET OPENING OF (CIRCUIT BREAKER). NEGATIVE DISCONNECT CANNOT BE USED TO OPEN THE CIRCUIT BREAKER until the CURRENT CIRCUIT BREAKER IS CLOSED.

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NOT FOR CONSTRUCTION

TPSS #1

SINGLE LINE DIAGRAM

SYSTEM

NOTES

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2. OPENING CIRCUIT BREAKER (52/L1) AND NEGATIVE DISCONNECT CANNOT OCCUR AT THE SAME TIME.
NOTES:
1. INTERIOR EQUIPMENT NOT SHOWN ON THIS DRAWING.
2. FOR SUBSTATION EQUIPMENT LAYOUT, SEE DRAWING TPPL1-2.

TPPL1-2
SYSTEM

NOT FOR CONSTRUCTION

TPSS #1 YARD EQUIPMENT PLAN

KEEP CLEAR
10' X 40' ACCESS SPACE

INTERNAL ACCESS SPACE
KEEP CLEAR

TRANSFORMER
RECTIFIER
PAD
SWITCH

MCB
DT

Scale: 3/16" = 1'

0'-1/2"
2'-1/2"
4'-1/2"
30'-0"
15'-0"
16'-6"
6'-10 1/2"
5'-7 3/4"
8'-8"
5'-8"
4'-6"
100'-0"

TPSS #1 YARD EQUIPMENT PLAN

DATE: 7/19/2017
CHECKED: 9:52:03 PM

FILE: SHT_WL_TP_PL_111
FILENAME: SHT_WL_TP_PL_111
SCALE: 3/16"= 1'

DRAWN: AS NOTED

DESIGNED: 07/21/17

NORTHERN, INDIANA COMMUTER TRANSPORTATION DISTRICT
DYER TO HAMMOND, INDIANA
60'-0"
40'-0"

www.hdrinc.com
Chicago, IL 60631
8550 W Bryn Mawr Ave., Suite 900
HDR Engineering, Inc.

DATE: 07/03/17
PAGE: 5 OF 248

TRANSFORMER
RECTIFIER
PAD
SWITCH

MCB
DT

Scale: 3/16" = 1'
TPPS #1 SUBSTATION EQUIPMENT LAYOUT

Scale: 1/4" = 1'

NOTES:
1. INTERIOR EQUIPMENT SHOWN ON THIS DRAWING.
   SUBSTATION BUILDING ROOF NOT SHOWN ON THIS DRAWING.
2. INTERIOR ELECTRICAL INTERCONNECT TO THE NIPSCO EQUIPMENT IS VIA THE
   NIPSCO PROVIDED TERMINAL CABINET.

TPPL1-3 SYSTEM

NOT FOR CONSTRUCTION

NIPSCO PROVIDED TERMINAL CABINET.

NICTD ELECTRICAL INTERFACE TO THE NIPSCO EQUIPMENT IS VIA THE
INTERIOR EQUIPMENT SHOWN ON THIS DRAWING.

Non-Technical Notes:
- 10'-0" ACCESS SPACE KEPT CLEAR
- 10'-0" X 40' ACCESS SPACE
- 5'-0" DRAWOUT SPACE AND UNIT HEATERS
- 10'-0" X 40' TRANSFORMER AREA
- 40'-0" X 30'-0"
- 10'-0" X 40' TRUCK LIFT AREA
- 26'-0" X 20'-0"
- 10'-0" X 40' TRUCK LIFT AREA
- 20'-0" X 10'-0"
- 10'-0" X 40' ACCESS SPACE
- 10'-0" X 40' TRANSFORMER AREA
- 40'-0" X 30'-0"
- 10'-0" X 40' TRUCK LIFT AREA
- 26'-0" X 20'-0"
- 10'-0" X 40' ACCESS SPACE
- 10'-0" X 40' TRANSFORMER AREA
- 40'-0" X 30'-0"
- 10'-0" X 40' TRUCK LIFT AREA
- 26'-0" X 20'-0"
- 10'-0" X 40' ACCESS SPACE
- 10'-0" X 40' TRANSFORMER AREA
- 40'-0" X 30'-0"
- 10'-0" X 40' TRUCK LIFT AREA
- 26'-0" X 20'-0"
- 10'-0" X 40' ACCESS SPACE
- 10'-0" X 40' TRANSFORMER AREA
- 40'-0" X 30'-0"
- 10'-0" X 40' TRUCK LIFT AREA
- 26'-0" X 20'-0"
- 10'-0" X 40' ACCESS SPACE
- 10'-0" X 40' TRANSFORMER AREA
- 40'-0" X 30'-0"
- 10'-0" X 40' TRUCK LIFT AREA
- 26'-0" X 20'-0"
- 10'-0" X 40' ACCESS SPACE
- 10'-0" X 40' TRANSFORMER AREA
- 40'-0" X 30'-0"
- 10'-0" X 40' TRUCK LIFT AREA
- 26'-0" X 20'-0"
- 10'-0" X 40' ACCESS SPACE
- 10'-0" X 40' TRANSFORMER AREA
- 40'-0" X 30'-0"
- 10'-0" X 40' TRUCK LIFT AREA
- 26'-0" X 20'-0"
- 10'-0" X 40' ACCESS SPACE
- 10'-0" X 40' TRANSFORMER AREA
- 40'-0" X 30'-0"
- 10'-0" X 40' TRUCK LIFT AREA
- 26'-0" X 20'-0"
- 10'-0" X 40' ACCESS SPACE
- 10'-0" X 40' TRANSFORMER AREA
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- 10'-0" X 40' TRANSFORMER AREA
- 40'-0" X 30'-0"
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- 10'-0" X 40' ACCESS SPACE
- 10'-0" X 40' TRANSFORMER AREA
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- 10'-0" X 40' TRUCK LIFT AREA
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- 10'-0" X 40' TRANSFORMER AREA
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- 40'-0" X 30'-0"
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- 10'-0" X 40' ACCESS SPACE
- 10'-0" X 40' TRANSFORMER AREA
- 40'-0" X 30'-0"
- 10'-0" X 40' TRUCK LIFT AREA
- 26'-0" X 20'-0"
- 10'-0" X 40' ACCESS SPACE
- 10'-0" X 40' TRANSFORMER AREA
- 40'-0" X 30'-0"
- 10'-0" X 40' TRUCK LIFT AREA
- 26'-0" X 20'-0"
- 10'-0" X 40' ACCESS SPACE
- 10'-0" X 40' TRANSFORMER AREA
- 40'-0" X 30'-0"
- 10'-0" X 40' TRUCK LIFT AREA
- 26'-0" X 20'-0"
TPS #1 SUBSTATION INTERIOR ELEVATION SECTION B-B

Scale: 1/2" = 1'

1. 125VDC PANEL SHALL BE FLUSHED WITH THE BATTERY CHARGER.

NOT FOR CONSTRUCTION

WEST LAKE CORRIDOR - MP #1 TO MP #9 - SINGLE TRACK

TPSS #1 INTERIOR ELEVATION (2 OF 4)

206 AHR, 125 VDC BATTERY RACK

BATTERY CHARGERS

206 AHR, 125VDC BATTERY RACK

DC BREAKER TEST CABINET

240/120V AC PANEL

240/120V AC PANEL

STORAGE LOCKER

NEGATIVE BUS BAR PANEL

FUSED DISCONNECT SWITCH

DUPLEX RECEPTACLE

DUPLEX RECEPTACLE

DETECTOR GROUND BUS

HYDROGEN GENERATOR

INTEGRAL CEILING HEIGHT
TPS #1 SUBSTATION EXTERIOR ELEVATION SECTION A-A

Scale: 1/2" = 1'

HINGED REAR DOOR WITH PADLOCKABLE HANDLE TYPE
TPSS #1 SUBSTATION EXTERIOR ELEVATION SECTION C-C

Scale: 1/2" = 1'

NOT FOR CONSTRUCTION

TPSS #1 EXTERIOR ELEVATION (3 OF 4)

DYER TO HAMMOND, INDIANA

HIGH VOLTAGE DANGER

WARNING SIGNS

EXTERIOR LIGHT

LOUVER
NOTES

1. ANY DISCONNECT SWITCH, MAIN DISCONNECT SWITCH, OR MAIN CIRCUIT BREAKER IN AN ENCLOSURE LOCATED OUTSIDE SPECIFIED AREAS SHALL BE INDICATED.

2. CHARGE BUS BREAKERS (DC) AND MAIN DISCONNECT SWITCH (DC) ARE THE PROPERTY OF THE UTILITY COMPANY, NIPSCO.

NOT FOR CONSTRUCTION
NOTES
1. INTERIOR EQUIPMENT NOT SHOWN ON THIS DRAWING
2. FOR SUBSTATION EQUIPMENT LAYOUT, SEE DRAWING TP_PL_2-2

TPSS #2 YARD EQUIPMENT PLAN

scale: 1/16 = 1'

TRANSFORMER
RECTIFIER
PAD
SWITCH
MCB
DT

NOT FOR CONSTRUCTION

HDR ENGINEERING, INC.
33 East Highway 12
Chesterton, Indiana 46304

DATE: 7/19/2017
PLOT DATE: 9:54:27 PM

NORTHERN INDIANA COMMUTER TRANSPORTATION DISTRICT
DYER TO HAMMOND, INDIANA

TPSS #2 YARD EQUIPMENT PLAN
SYSTEM

SHEET W/L TP_PL_2-1

FILENAME
SCALE
DATE
NOTES
CHECKED
ISSUE
DESCRIPTION
SERIES
AS NOTED
07/21/17
SINGLE TRACK
NICTD - WEST LAKE CORRIDOR - MP WL 61.38 TO WL 69.18
DYER TO HAMMOND, INDIANA

0'-0"
2'-0"
30'-0"
15'-0"
16'-6"
5'-7 3/4"
8'-8"
5'-8"
4'-6"
100'-0"

KEEP CLEAR
10' X 40' ACCESS SPACE
KEEP CLEAR
TPPS #2 SUBSTATION EQUIPMENT LAYOUT

Scale: 1/4" = 1'

NOTES
1. INTERIOR EQUIPMENT SHOWN ON THIS DRAWING.
2. EXTERIOR BUILDING ROOF NOT SHOWN ON THIS DRAWING.
3. INTERIOR EQUIPMENT SHOWN TO THE INTERIOR EQUIPMENT IS VIA THE NIPSCON PROVIDER TERMINAL CABINET.

TPPS #2 SUBSTATION EQUIPMENT LAYOUT

NIPSCON TERMINAL CABINET

DC SWITCH GEAR

DOORS:

UNIT HEATERS:

MOTION DETECTOR:

ENDS

DETECTOR:

MOTION

INTRUSION ALARM PANEL

COMMUNICATIONS RACKS

STORAGE

BATTERY CHARGER

FUSED DISCONNECT SWITCH

SERVICE AISLE FOR BREAKER TESTING

15-LB CO2 FIRE EXTINGUISHER

10-LB CO2 FIRE EXTINGUISHER

BATTERY RACK

DC BREAKER TEST

240/120V DC PANEL

240/120V AC PANEL

10'-0" ACCESS SPACE

KEEP CLEAR

10'-0" DECOMMISSION SPACE AND 10'-0" THICK AMAZITE FLOOR

3'-0" DECOMMISSION SPACE AND 3'-0" THICK AMAZITE FLOOR

SCADA RTU CABINET

VENTILATION FAN

RACKS

COMMUNICATIONS

LOCKER

STORAGE

BATTERY CHARGER

FUSED DISCONNECT SWITCH

SERVICE AISLE FOR BREAKER TESTING

15-LB CO2 FIRE EXTINGUISHER

10-LB CO2 FIRE EXTINGUISHER
TPS #2 SUBSTATION INTERIOR ELEVATION SECTION B-B

Scale: 1/2" = 1'

NOTES

1. ALL PEC PANELS SHALL BE PLUGGED WITH THE BATTERY CHARGERS.
NOTES

1. ANY OPEN INTERLOCK INKS, PROPERTY OWNED OR
   OPERATED BY THE ELECTRIC COMPANY IS OWNED AND
   CONTROLLED BY THE ELECTRIC COMPANY. NO MINOR
   DISCONNECT SWITCH IS CLOSED AND SMALL
   DISCONNECT SWITCH IS OPEN. THE (CHALLENGED)
   MINOR DISCONNECT IS CLOSED.

2. CIRCUIT BREAKER BREAKS 52/L1 AND MANUAL
   DISCONNECT SWITCH ARE THE PROPERTY
   OF THE UTILITY COMPANY, NIPSCO.

NOTES OF THE UTILITY COMPANY, NIPSCO.

DISCONNECT SWITCH (89/L1) ARE THE PROPERTY

OUTDOOR CIRCUIT BREAKER (52/L1) AND MANUAL

2.

THE (189N/REC1) NEGATIVE DISCONNECT IS CLOSED.

PREVENT CLOSE OF THE RECTIFIER BREAKER UNLESS

RECTIFIER BREAKER(172/M1) IS OPENED AND SHALL

1.

KIRK KEY INTERLOCK WILL PREVENT OPENING OF

NOTES OF THE UTILITY COMPANY, NIPSCO.

DISCONNECT SWITCH (89/L1) ARE THE PROPERTY

OUTDOOR CIRCUIT BREAKER (52/L1) AND MANUAL

2.

THE (189N/REC1) NEGATIVE DISCONNECT IS CLOSED.

PREVENT CLOSE OF THE RECTIFIER BREAKER UNLESS

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NOTES OF THE UTILITY COMPANY, NIPSCO.

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OUTDOOR CIRCUIT BREAKER (52/L1) AND MANUAL

2.

THE (189N/REC1) NEGATIVE DISCONNECT IS CLOSED.

PREVENT CLOSE OF THE RECTIFIER BREAKER UNLESS

RECTIFIER BREAKER(172/M1) IS OPENED AND SHALL

1.

KIRK KEY INTERLOCK WILL PREVENT OPENING OF

NOTES OF THE UTILITY COMPANY, NIPSCO.
NOTES
1. FOR TRACTION POWER SINGLE LINE DIAGRAM, SEE DRAWING TP_SL3-1.

NOT FOR CONSTRUCTION

AC DISTRIBUTION PANEL
DECEMBER 23, 2017

SEE NOTE 1

MANUAL DISCONNECT SWITCH (WITH AUX CONTACTS)

TO 1500 VDC SWITCHGEAR

SEE NOTE 1

TPSS #3 AUX SINGLE LINE DIAGRAM

SYSTEM

DYER TO HAMMOND, INDIANA

NOTE: AS NOTED OF SERIES

NOT FOR CONSTRUCTION
NOTES
1. INTERIOR EQUIPMENT NOT SHOWN ON THIS DRAWING.
2. FOR SUBSTATION EQUIPMENT LAYOUT, SEE DRAWING TP_3-2.

TPSS #3 YARD EQUIPMENT PLAN

SCALE: 3/16" = 1'

NOT FOR CONSTRUCTION

TPSS #3 YARD EQUIPMENT PLAN SYSTEM

DYER TO HAMMOND, INDIANA

NORTHERN INDIANA COMMUTER TRANSPORTATION DISTRICT
33 East Highway 12
Chesterton, Indiana 46304

HDR ENGINEERING, INC.
CHICAGO, IL 60631
8550 W. BRYN MAWR AVE., SUITE 900

DATE: 7/19/17
PLOT DATE: 9:56:58 PM

DRAWN: JG J E L M A
CHECKED: AS NOTED

FILENAME: TPPL3-3
SHEET: WTL_TP_PL_3-1
SERIES: OF

TPPL3-3

TRANSFORMER
RECTIFIER
PAD
SWITCH
MCB
DT

KEEP CLEAR
10' X 40' ACCESS SPACE
KEEP CLEAR

6'-10 1/2"
5'-7 3/4"
8'-8"
5'-8"
4'-6"
100'-0"
TPPS #3 SUBSTATION EQUIPMENT LAYOUT

Scale: 1/4" = 1'

NOTES:
1. INTERIOR EQUIPMENT SHOWN ON THIS DRAWING. SUBSTATION BUILDING ROOF NOT SHOWN ON DRAWING.
2. INTERIOR ELECTRICAL CONNECTION TO THE NIPSCO EQUIPMENT IS VIA THE NIPSCO PROVIDED TERMINAL CABINET.

TPPS #3 SUBSTATION EQUIPMENT LAYOUT

Scale: 1/4" = 1'

NOT FOR CONSTRUCTION

TPPL3-3 OF TPPL3-3

NOTED - WEST LAKE CORRIDOR - INLET #1, #2 TO WL 69.18
SINGLE TRACK

TPPL3-3 OF TPPL3-3

NOTED - WEST LAKE CORRIDOR - INLET #1, #2 TO WL 69.18
SINGLE TRACK

TPPS #3 SUBSTATION EQUIP LAYOUT SYSTEM

DYSER TO HAMMOND, INDIANA

JAS
1. Battery Panel shall be flush with the Battery Charger.

TPS #3 Substation Interior Elevation Section B-B

Scale: 1/2" = 1'

NOTES

1. Battery Panel shall be flush with the Battery Charger.

TPSS #3 Interior Elevation (2 of 4)

NOT FOR CONSTRUCTION

TPP #3-8

SYSTEM

Dyer to Hammond, Indiana

NORTHERN INDIANA COMMUTER TRANSPORTATION DISTRICT
33 East Highway 12
Chesterton, Indiana 46304

HDR Engineering, Inc.
Chicago, IL 60631
8550 W Bryn Mawr Ave., Suite 900

DATE
07/21/17

DESCRIPTION
AS NOTED

ISSUE
OF

SERIES

FILE NAME
DC BREAKER

DC BREAKER

TEST CABINET

FUSED DISCONNECT SWITCH

BATTERY RACK

206 AHR, 125 VDC BATTERY RACK

BATTERY CHARGERS

240/120V AC PANEL

RECEPTACLE DUPLX

SWITCH DUPLEX

GROUND BUS PERIMETER SENSOR

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)

STORAGE LOCKER

PORTABLE EYE WASH

EYE WASH

LIGHTING PANEL

NEGATIVE BUS BAR PANEL

240/120V AC PANEL

HYDROGEN GENERATOR

IN TEB (4)
COPPER PERIMETER GROUND BUS SPLICE ACROSS VERTICAL COLUMNS
TYP. FOR SHIPPING SPLITS

MOTION DETECTION

COPPER PERIMETER GROUND BUS
TYP. FOR ALL FOUR INTERIOR WALLS

EMERGENCY LIGHTS AND EXIT SIGNS

LIGHT SWITCH
TYP. BOTH DOORS

DUPLEX RECEPTACLE
TYP. BOTH DOORS

EMERGENCY LIGHTS AND EXIT SIGNS

COPPER PERIMETER GROUND BUS SPLICE ACROSS VERTICAL COLUMNS

MOTION DETECTION

COPPER PERIMETER GROUND BUS
TYP. FOR ALL FOUR INTERIOR WALLS

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COPPER PERIMETER GROUND BUS SPLICE ACROSS VERTICAL COLUMNS

MOTION DETECTION

COPPER PERIMETER GROUND BUS
TYP. FOR ALL FOUR INTERIOR WALLS

EMERGENCY LIGHTS AND EXIT SIGNS

LIGHT SWITCH
TYP. BOTH DOORS

DUPLEX RECEPTACLE
TYP. BOTH DOORS

EMERGENCY LIGHTS AND EXIT SIGNS

COPPER PERIMETER GROUND BUS SPLICE ACROSS VERTICAL COLUMNS

MOTION DETECTION

COPPER PERIMETER GROUND BUS
TYP. FOR ALL FOUR INTERIOR WALLS

EMERGENCY LIGHTS AND EXIT SIGNS

LIGHT SWITCH
TYP. BOTH DOORS

DUPLEX RECEPTACLE
TYP. BOTH DOORS

EMERGENCY LIGHTS AND EXIT SIGNS

LOUVER

MOTION DETECTOR

COPPER PERIMETER GROUND BUS SPLICE ACROSS VERTICAL COLUMNS
TYP. FOR SHIPPING SPLITS

EMERGENCY LIGHTS AND EXIT SIGNS
**Typical OCS Pole Conduit Routing Detail**

- **Foundation:**
  - Anchor Bolt
  - Rebar Cage
  - Foundation Bolt

- **Coupling (Typ):**
  - 4'-0" Radius
  - 5" DIA.

- **Accessories:**
  - 5" Dea. Fire

- **Splice Cap(s):**
  - Are spaced, 18" apart

- **Sold:**
  - IF Applicable

- **In Use:**
  - Spare Capped

- **Dimensions:**
  - 9" MIN
  - 30" MIN

**Description:**

- **OCS Poole Conduit Routing Details System**
- **NORTHERN INDIANA COMMUTER TRANSPORTATION DISTRICT**
- **Dyer to Hammond, Indiana**
- **7/19/2017**

**Drawn:**

**Checked:**
NOTES

1. CADWELD TYPE, LISTED FOR REFERENCE ONLY AND DOES NOT PRECLUDE ANY OTHER APPRROVED MAKERS.

2. USE CORROSION PREVENTIVE MATERIALS ON ALL GROUND RODS (E.G., 3/4" DIAMETER COPPER-CLAD STEEL).

3. BARE COPPER CABLE, LIGHTLY COATED OR TIN PLATED COPPER 2'-6" LONG. HORIZONTAL SURFACE (NOTE 1) "HA" TO CADWELD TYPE "VS"

4. A U-BOLT CLAMP TO BE INSTALLED FROM THE GROUND BUS TO EACH GATE POST AND EVERY CORNER POST.

5. BARE COPPER 2'-6" IN LONG ARE REQUIRED.

6. GATE POSTS, EVERY GATE POST AND EVERY CORNER POST.

7. POSTS, EVERY GATE POST AND EVERY CORNER POST.

8. A #2/0 AWG COPPER CABLE SHALL BE CONNECTED FROM THE GROUND GRID TO EVERY OTHER FENCE POST, EVERY CORNER POST AND EVERY GATE POST. CONNECT USING A DIELECTRIC BITUMASTIC COATING SO THAT THE ENTIRE CONNECTION IS COMPLETELY ENCAPSULATED. COATING SHALL BE TAPECLOAD BY ROYSTON OR APPROVED EQUAL.

9. UNLESS OTHERWISE NOTED, ALL GROUND RODS SHALL BE 3/4" DIAMETER COPPER-CLAD STEEL.

10. PIPE AND CONDUIT OPENING TO BE PACKED WITH DUCT-SEAL MATERIAL TO PREVENT WATER STAGNATING IN THE CONDUIT.

11. CONSTRUCTION DETAILS TO FOLLOW. (NOTE 1) CADWELD TYPE "TA" OR "XA OR XB"

12. PIPE AND CONDUIT OPENING TO BE PACKED WITH DUCT-SEAL MATERIAL TO PREVENT WATER STAGNATING IN THE CONDUIT.
NOTES
1. WARNING: CROSSING UNDER TRACK, TOP OF CONDUITS TO BE 4" ABOVE AND 4" ABOVE TOP OF HIGH RAIL UNLESS OTHERWISE SPECIFIED.
2. TRANSITION FROM TCL TO RAILWAY PROPERTY AS SHOWN ON ELEMBANK DRAWINGS TO BE MADE WITH LOW CONDUCT SWEEPS.
3. MINIMUM CONDUITS DO NOT APPLY AT CROSSINGS TO OTHER UTILITIES OR PIPES.
4. ALL CONDUITS TO BE COVERED NOTED OTHERWISE.
5. INSTALL YELLOW WARNING TAPE 12" BELOW TOP OF FINISHED GRADE CONTINUOUSLY FOR ENTIRE DUCT LINE.
6. ALL UNDERGROUND TRACTION POWER CONDUITS TO BE ENCASED IN CEMENT CONCRETE.
7. DUCT BANK TO BE CONCRETE ENCASED, STEEL REINFORCED. FOR CLARITY REINFORCEMENT TO BE SHOWN FOR ALL SECTIONS. ALL SECTIONS FOR TOPSIDE INSTALLATION - ROW STAKES TO BE MOUNTED FOR TOP, BOTTOM, AND SIDES WITH 4" HOLE 12" DEEP AROUND FOR ALL SECTIONS.
8. CONCRETE PUMP VALVES TO BE MINIMUM 4" FOR 2" DIAMETER CONDUITS, 5" FOR 3" DIAMETER CONDUITS.

SECTION A-A
Scale: NTS

SECTION B-B
Scale: NTS

2'-5"

5"Ø FRE

TOP OF GRADE

COMPACTED FILL

TAPE (TYP)

TOP OF GRADE

COMPACTED FILL

TAPE (TYP)

TOP OF GRADE

COMPACTED FILL

TAPE (TYP)

TOP OF GRADE

COMPACTED FILL

TAPE (TYP)
NOTES
1. RUN CONDUCTOR BETWEEN RUNNING RAIL SECTIONS TO MAINTAIN CONTINUITY.
2. CONTACT WIRE SWITCH SHALL BE PROVIDED WITH AUXILIARY CONTACTS.

MAINTENANCE AND STORAGE

SCALE: 1" = 20'

SWITCH OPERATOR

SCALE: 1/8" = 1'

CONTROL DIAGRAM

ELEVATION DIAGRAM SECTION A-A (Typ. 3 Electric Tracks)

ELEVATION DIAGRAM SECTION B-B

WHEEL TRUING MACHINE SECTION B-B

SWITCH OPERATOR FRONT ELEVATION

OVERHEAD CONTACT WIRE (Typ. 3)

ELECTRIFIED TRACK 1

ELECTRIFIED TRACK 2

ELECTRIFIED TRACK 3

MAINTENANCE AND STORAGE FACILITY AREA

Scale: 1" = 20'

HORN

120 VAC

STROBE

SWITCH

LOAD BREAK SWITCH

CONTACT WIRE (Typ. 3)

CONDUCTOR

CONTACT WIRE SWITCH SHALL BE PROVIDED WITH AUXILIARY CONTACTS.

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NICTD - WEST LAKE CORRIDOR - MP WL 61.38 TO WL 69.18

DYER TO HAMMOND, INDIANA

M&SF AREA PLAN AND DETAILS

SYSTEM

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